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Shift-over to VHF Radio Ranges Will Begin Soon, Says Stanton

The work of shifting the radio ranges of the entire CAA airways system over to very-high-frequency range equipment, a program which was begun in 1941 and interrupted by the war, is expected to be resumed this spring according to a recent speech by CAA Administrator Charles I. Stanton before the American Institute of Electrical Engineers and Institute of Radio Engineers in New York.

Saturation Point

"A saturation point has already been reached in the use of the present type of range," he said, "and few if any frequencies are available for future expansion of the range system."

In explaining the need for improved radio equipment such as the very-high-frequency range, Stanton called attention to the 40-fold growth of aircraft movements handled by CAA traffic control centers in the past 5 years. "Part of this increase," he said, "was absorbed by the creation of 15 additional control centers, but with 23 now in operation we believe we have divided the United States into the smallest areas practical for handling traffic which moves, in most cases at about 180 miles an hour."

Satisfactory control of the increased commercial traffic anticipated after the war will be impossible, he believes, without improved radio and communications equipment.

"To overcome the limitations of the low-frequency ranges," he said, "and to provide for future expansion of the airways system, the Civil Aeronautics Administration has for several years been engaged in the development of very-high-frequency radio range to operate in the frequency band 119 to 126 megacycles. At those frequencies atmospheric and precipitation static interference is practically nonexistent, and interference between stations on the same frequency will not occur at practical flying altitudes provided their geographical separation is 200 miles or more."

Besides use of very-high-frequencies for radio ranges, he discussed their application in the instrument landing systems at airports.

"The CAA, in cooperation with the War Department," he said, "is installing at more than 100 airports very-high-frequency radio transmitting equipment designed to permit properly equipped aircraft to make instrument approaches in very low ceilings and visibilities—or even landings in zero-zero conditions. At present, only military aircraft are so equipped.

"A complete instrument landing system consists essentially of four separate transmitting stations located on or near the airport. These four elements are known as the (1) localizer, (2) glide path, (3) boundary marker, and (4) outer marker. A middle marker is being installed at some airports. Although any number of markers may be used, two are usually sufficient.

Guides Plane

"The localizer provides a very accurate lateral guidance so that approaching aircraft can maintain a heading that will lead them over the center of the runway. The glide path provides vertical guidance enabling the aircraft to maintain the proper rate of descent. The markers provide reference points or 'fixes' along the approach paths, which permit pilots to verify their positions and altitudes.

"No glide path is included in current installations, for equipment is not available. But the glide path equipment is expected to be installed as soon as it is available.

"Use of the localizer and markers alone permits instrument approaches under weather conditions much less favorable than those now required. Thus, approaches to an airport with 100-foot ceiling and one-fourth mile visibility will become feasible, whereas present minimums are 400-foot ceiling and one mile visibility."

While commercial and military planes are the chief users of the airways facilities today, Stanton believes that the post war private flier will want and demand radio equipment in his plane both for use in obtaining weather information and to make flying safer and simpler.

"The radio compass, which makes it possible for a plane to fly straight toward the station on which it is tuned, will probably be standard factory equipment, except on the lowest priced planes and on training planes which stay near the airports on which they are based," he said.

Radio Equipped

"The private owner's radio equipment," he concluded, "will probably be a receiver operating on very-high-frequencies, with a direction finding attachment. In quantity production, such equipment should sell for a modest price. At least one company is prepared to produce the receiver alone for less than $30. For communication, many private owners will want a transmitter, operating on high frequency for communication with airport towers and CAA communications stations. This transmitter should cost not more than $50 on a mass production basis, and quantity production might bring the cost of the complete installations down to $150."

The technical description of the very-high-frequency radio range contained in the Administrator's speech is given below.

"The very-high-frequency range developed by the CAA operates on a somewhat different principle from the low-

(*See Shift-over, page 39*)

Suggest 27 Ways To Improve Traffic Control Methods

The Army terms "downwind leg," "base leg," and "approach leg," used to describe the flight path during approach and landing have been adopted as part of the standard CAA pilot-control tower jargon as the result of a suggestion made by Tirey K. Vickers, Cleveland tower. This suggestion is one of the 27 which have been accepted by the CAA Air Traffic Control division since its "suggestion plan" was put into effect September 1, 1943. Four more of the suggestions are pending decision.

In response to ATC's quest for better ways of doing things, 173 suggestions were offered during the first 3 months of the program by field workers in 7 of the CAA regions.

Suggestions included ideas for improving training courses, control phraseologies, use of equipment, procedures, weather information, and personnel handling.

While 142 of the suggestions were not adopted, very few of these were impracticable. Eighteen were already covered by existing regulations. Sixteen presented technical difficulties. Twenty-four concerned ideas already adopted and awaiting the end of the war or availability of funds or equipment. Eleven were considered too costly.

Under the present set-up the Washington office acts as a clearing house for suggestions through a committee which is made up of one person from each section in the ATC division. Whether suggestions will continue to be handled in this manner is awaiting the comments and recommendations of the regional managers.

Described below are a number of the suggestions which have been or will be adopted by the ATC.

A pamphlet "Air Navigation Instruction Aids" written from a layman's viewpoint by suggestor Herbert H. Thompson, New York training center, will be used in the ATC training course to simplify methods of teaching air navigation.

The suspension of traffic-light guns in control towers so as to prevent reflections which might be mistaken for light signals by aircraft on the airport is a suggestion of Arthur E. Watters, Battle Creek tower.

For more efficient control of receiver-only equipped aircraft, certain procedures combining the use of the traffic-light gun and radio were suggested by Norman R. Smith, Cincinnati tower.

Austin M. Stapf, Washington center, suggested that ceilings and cloud level heights be reported up to 17,000 feet above sea level. And Charles E. Hedrick also of the Washington center, suggested that the percentage of cloudiness be included with ceiling heights in hourly weather reports. Both of these suggestions are being studied by the Weather Bureau prior to probable adoption.

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CAA Draws Model Act To Curb Obstructions

A model act providing uniform zoning regulations for all publicly owned airports is now in the hands of nearly all state legislatures.

Consideration might possibly be given the bill this year by at least 8 state legislatures, which will be in regular session. Action on the bill in these legislatures would affect the zoning of 99 publicly owned airports within the boundaries of Kentucky, Louisiana, Mississippi, New Jersey, New York, Rhode Island, South Carolina, and Virginia.

The proposed law was drafted by the Airports division of the CAA in collaboration with the National Institute of Municipal Law Officers. It is the crystallization of studies made by aeronautical experts, students of municipal government, and advocates of uniformity in state laws and has been approved by the Council of State Governments.

If enacted, the proposed bill will give the zoning boards it creates, the authority to prevent erection of any hazardous obstruction. The measure will also allow condemnation of existing obstructions outside city limits.

AAF Accidents

"Aircraft Accident"—Army regulations 95–120—dated December 17, 1943, may be secured from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. The two-page pamphlet sells for 5 cents and supersedes AR 95–120 issued June 18, 1942. Classification number W 1.6/1: 95–120 should be included when ordering.

Factors Affecting Cities' Air Growth Explored By Ryan

The notion that a city's geographical position will ensure it a central place in the air commerce of the future was debunked by Oswald Ryan, Member of the Civil Aeronautics Board, in a recent address at the launching of the Aviation Section of the New York Board of Trade.

New York a Traffic Center

Ryan brought out the idea that the importance of a city in the air sense does not depend upon any consideration of distance from a coast but upon that city's ability to generate traffic. In this respect he stated that New York in particular would derive its position as an international air terminal from the fact that it is the principal air traffic generating center and sits astride the air tracks of the world. He said that on the basis of the most reasonable estimates New York City should become the terminal for some 600,000 air travelers a year.

Quotable Quotes

Quotable remarks of Ryan's on the future of aviation included "We must not squander the peace our armed forces will have won . . . this war has become a gigantic laboratory of experiment and discovery in the field of aviation . . . no two important cities on earth will be farther apart by air than New York and Los Angeles now are by train."

John F. Budd, publisher of the magazine "Air Transportation" and an authority in the export-import field, has been named chairman of the New York board's aviation group.

Planes Can Be Rented By Private Fliers Again

Requirements that would-be student fliers prove to the Civil Aeronautics Administration that they are training for a specific war job have been dropped.

Since early in 1943, this had been necessary under a WPB order limiting the sale and rental of aircraft, which was recently rescinded.

Repeal of this order lifts restrictions on rental of planes by private pilots, of whom there are about 97,000 certificated by CAA.

The limitation order was designed primarily to make airplanes available to the CAA War Training Service a year ago, when it undertook an expanded program for the Army Air Forces. Since the armed forces are now reducing their use of WTS facilities, it is no longer necessary to reserve airplanes for this purpose.

Split-second Information Service Insures Safe Trips Along Airways

Airmen are finding that flight information services are being provided on a scale never before experienced. This is the result of a concentration of effort on the part of CAA's Information and Statistics service, and Air Traffic Control and Communications divisions, the Weather Bureau, and the Flight Control division of the Army Air Forces.

On the Ground

Through frequent issuance of flight information bulletins, one of them the *Weekly* Notice to Airmen, the CAA keeps all military and civil airports, and points along the airways, advised of changes in field conditions and radio facilities, and of such hazards as areas congested by training activities. Among the bulletins are a directory of airports, a bimonthly compilation of data on air navigation radio aids, a handbook of instrument approach procedures, and a compilation of "danger areas."

Before a pilot takes off he has access to the published flight information and can plan his flight accordingly. However, information on changes of a transitory nature, which may develop while a plane is in flight, such as icing, low ceiling and visibility, and extreme turbulence, must be transmitted by radio. The successful gathering and relaying of flight information calls for close collaboration.

Help Enroute

The functions of airway traffic control centers have long been similar to those of railroad dispatchers; those of communications stations to railroad signalmen. But, like the relationship of the engineer and dispatcher, assistance has been given whenever the pilot has *asked* for it. Now the centers and stations are required to reach out with their radio voices whenever they have information which will aid in successful completion of a flight.

Each center and station watches a certain portion of the country, studies flying conditions in these areas, and abstracts all information that will assist pilots to conduct safe and efficient flights over them. Both communications station and control center personnel pass out flight information as *advice* to pilots but when conditions call for a suggested change in flight plan the control center is notified. Since a change in flight plan by one plane affects the general traffic pattern it is important that such change be approved by the traffic controller, who is responsible for keeping aircraft adequately separated.

The traffic controller is aided by this exchange of information. He directs the flow of traffic so as to permit the maximum number of movements compatible with safety from collision. This requires an accurate knowledge of present and anticipated weather conditions in order that he may exercise proper control over aircraft operating or intending to operate in instrument weather conditions.

Two-way Radio

Nearly all communications stations are now equipped, and the small remainder will soon be ready, to maintain reliable two-way radio contact with pilots. These stations are connected with traffic centers by interphone circuits and with each other by teletype circuits. They relay to pilots the information received from traffic centers and army flight control officers. Also, when they know pilots' flight plans they can compute arrival times over their stations and contact the pilots with pertinent information.

The army's Flight Control division has established offices in or immediately adjacent to each CAA airway traffic control center for the purpose of issuing advice concerning hazardous flying conditions to army aircraft. The officers manning these stations maintain a progressive check on the movements of army aircraft and coordinate their work closely with the CAA airway traffic controllers.

Join Forces

Each agency, in providing its portion of the flight service, is dependent to a certain extent upon the others. The forecaster providing up-to-date, accurate advice concerning weather conditions; the airway controller preparing advisory messages to flights under his jurisdiction; the flight control officer plotting the progress of army aircraft throughout his area and keeping the pilots posted with the latest data; and the communicator who provides the radio outlet for all these agencies in addition to furnishing pilots with information falling within his sphere—all function as a team to provide the "few well chosen words" which may spell the difference between successfully completed flight, or accident and disaster.

Six Airports Have New Control System

The approach control system in which the tower is asked by the center, when the need arises, to take over when a plane comes within 15 miles of the field is now in practice at six airports—Atlanta, Presque Isle, Pittsburgh, Kansas City, San Diego, and Medford (Oreg.). Fort Worth is proposed for the near future.

Aviation Agreement

A 10-page agreement between the United States and Paraguay concerning military aviation is now available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 5 cents a copy.

WTS Graduates to Get Pilot Certificates

Graduates of elementary and secondary pilot training courses in the War Training Service of the Civil Aeronautics Administration will be granted private pilot certificates without additional flight or written examinations, according to Charles I. Stanton, CAA Administrator.

WTS students who have received the cross country and Link instrument courses in addition, and who have logged as much as 160 hours in the air, will be given their commercial pilot certificates without additional written or flight examinations.

The Administrator's instructions affect directly the 4,167 men who have been in training as instructors, and whose training was discontinued January 15 by the Army Air Forces because no more instructors are needed. These trainees are still in the Army and, in most cases, would be unable to make arrangements for taking the routine written examinations and flight tests to obtain their certificates. Now, they need only apply to an aeronautical inspector of the CAA for certificates.

In the case of trainees who apply for commercial pilot certificates, the CAA inspector at the center where they received their training must certify that the applicants have met the aeronautical knowledge, experience and skill requirements of civil air regulations for the certificate and ratings sought, in addition to the other requirements.

Any Comments On ATC Service? Send a Postcard!

Pilots who have any comments or criticisms to make on the operation of the various CAA traffic control facilities are urged to drop a line on a postcard to the Civil Aeronautics Administration. To make it even easier, a special postcard has been prepared for the purpose and will be available at CAA field offices. The card may be mailed from any point, without postage.

The postcard form, which is already addressed and contains space for entering the name of the center or tower which is the subject of comment, pertinent facts about the flight and the pilot's comments and signature, is being used to replace a longer and less convenient form in an effort to reach all pilots using air traffic control service.

Comments are invited concerning such matters as promptness in issuing clearances, clarity of clearance phraseology, alertness of air traffic control personnel in supplying service, performance of airport traffic control radio and light signalling apparatus, or any other detail of air traffic control service which, in the opinion of pilots, is worthy of comment.

CAB Examiners Study Needs of Small City Service

How can air service be extended to the smaller cities? The answer, say CAB examiners W. J. Madden and A. E. Beitel, is found partly in adding new stops on established routes and partly in authorizing new feeder carriers. They recommended this course in their report on the Board's recent local feeder pick-up investigation.

Before feeder service is authorized, however, Examiners Madden and Beitel recommend that new carriers be committed to stringent economies in operation.

The examiners point out that long-haul equipment can reach fewer cities than the number which could be served if smaller and more economical equipment were developed. The necessarily different standards of operation, they hold, can best be developed by new carriers, organized for such purpose.

Economy Equipment

Among the economies suggested to keep operating costs in line with the relatively low traffic potential of small cities are use of smaller aircraft designed for feeder operation, a single pilot, elimination of extra services such as cabin attendants and meals, and reduction of intermediate station personnel.

A maximum rate of payment of 25 cents a mile for mail transportation was recommended to keep the cost to the government within reasonable limits.

Dividing Line

To clarify the field of activity for feeder service, it was recommended that extension of trunk-line service be limited to cities over 25,000 except where it is shown that expansion will not have adverse effects upon feeder operation in the same area.

On the other hand, appropriate limitations to nonstop and "skip-stop" schedules for each feeder service, were recommended to maintain a proper balance between operation by feeder and other carriers.

The report suggested that such limitation might, in one case, prohibit nonstop service between two points already covered by an existing carrier. It also suggested that the Board might fix a maximum nonstop distance, or a minimum number of intermediate points for any one schedule, and that situations may arise where no limitation would be necessary.

Any desire of feeder carriers to outgrow the job of serving the smaller cities and to reach out to big city traffic in competition with other carriers should be discouraged, the examiners believe, but they also contend there is a need in the feeder field for some nonstop and skip-stop service, as well as frequent stops.

The case of the operator who wishes to cultivate the business of the traveler who needs to get from a small town to a large town with the minimum of delay is cited to show how the operator should have some leeway in putting on skip-stop schedules.

Surface Carriers

Little encouragement is given the surface carrier applicants in the examiners' recommendation that air services by surface carriers should be rigidly confined to operations which are only auxiliary, supplemental, or incidental to the surface transportation. This stand is based on a long-established legislative policy of keeping various forms of transportation mutually independent.

Expansion of pick-up operations are advised only where a combination pick-up and passenger service will be operated and developed. Exception is made of unusual cases where the postal service may require plain pick-up service.

Recommended safety regulations for feeder service would permit passenger carrying on planes which also give pick-up service; service with single engine aircraft, and one-pilot operation.

Hearings on applications which base air service on the use of helicopters should be deferred until commercial helicopters are available, the examiners believe, and applications for feeder-service certificates should be heard together with applications for other services within any general area.

Await Comments

The conclusions in the 75-page report were arrived at by a careful weighing and summing up of all the material presented at the Board's hearing September 28–October 23, 1943. Final disposition of the proceedings will not be made until the Board has studied all comments on the report.

Contained in the report is a résumé of evidence presented at the hearing covering the travel characteristics of the Nation both by air and other transportation, air mail and air cargo potentials, operating costs, aircraft and airport design, and other information pertinent to the field of local air service.

Included in the data is a 1940 survey of the air passenger traffic in a group of smaller cities. Of the 18 cities under 10,000 surveyed only 3 had an average of more than 4.5 air passengers a day. About one-half of the 31 cities between 10,000 and 20,000 averaged 5 air passengers a day; only 3 had an average of greater than 10.

Facilities Suffice

The résumé included some significant views of the Post Office Department with regard to the expansion of air mail by feeder service. A letter from the Postmaster General claimed that there is little need for expanded air-mail facilities and stated that the present air network, with such expansion as may be feasible in individual cases, is sufficient to meet the present over-all requirements of the Postal Service. The normal trade channels, the letter stated, have long been covered by the general pattern of today's air transportation system, and future increases in mail volume for the most part will flow in these same channels. The letter, however, indicated that the Postal Service would benefit from some potential new routes "awaiting wise selection where traffic potentials indicate early self-sufficiency."

Little Air Cargo

As shown by the data presented in the report, air express revenue is a relatively small part of the total non-mail revenues received by operating air carriers. During 1942 express revenue amounted to 5.4 percent of total revenues. Of the total revenue in the pick-up service operated by All American Aviation, express revenue made up 1.1 percent in 1942 and approximately 1.7 percent in 1943. All American operates a small city pick-up service and its experience therefore indicates the proportion of air express revenue which may be expected from an expanded air service. In concluding that for some time expansion of service to small cities will have to be accomplished with little financial assistance from express or cargo revenue, the examiners cite difficulties that will be encountered. One is that a combination of volume and distance must be attained in order to generate substantial cargo revenue. In addition, the over-all cargo requirements for small cities are relatively small.

For unpretentious airport facilities, which will have to serve in many cases, some witnesses expressed the opinion that a single flight strip 2,000 to 2,500 feet in length would constitute a sufficient landing field. The use of such minimum facilities is premised upon the use of aircraft equipped with tricycle landing gear, which will minimize the effect of cross-wind landings.

Burden Appointed to High Commerce Post

William A. M. Burden, who as special aviation assistant to the Secretary of Commerce has been connected with the activities of the CAA. Weather Bureau, and Coast and Geodetic Survey since 1942, was recently appointed Assistant Secretary of Commerce.

Directly before coming to Commerce, Burden was in charge of the Defense Supplies Corporation program for eliminating Axis influence from Latin American air transportation.

Widely known as an aviation authority, Burden is a member of the National Advisory Committee for Aeronautics, the Institute of Aeronautical Sciences and a number of other aviation organizations.

From 1939–41 he was with the National Aviation Corporation as vice president and director in charge of air transport activities and has served as director for various other aviation corporations, including the United Airlines Transport Corporation.

Airlines Fare Well in 1942-43 Board's Annual Report Shows

The annual report of the Civil Aeronautics Board covering the period from November 1, 1942 to October 31, 1943, disclosed marked improvements in the financial position of the domestic air carriers, and increased air carrier operation.

Operating expenses of the air carriers declined about $10,000,000 because of substantially reduced equipment and consequently less total mileage flown, while revenues derived entirely from nonmail traffic increased about $7,000,000. Dividends paid aggregated about $2,500,000 or less than 8 percent of the operating profits during the year. Unappropriated earned surplus more than doubled to $27,000,000, while long-term debt decreased from about 2¼ million dollars to less than three-fourths of a million dollars.

Mail Pay Down

Compared with the previous year, payments for the transportation of mail by the government declined from 0.75 mill per pound-mile to 0.42 mill per pound-mile. The revenues and expenses of the domestic air carriers discussed in the report apply to commercial operations only and not to war contract services, the Board pointed out.

Mail service increased 2½ percent over prewar volume; express service increased more than 3½ times and the aggregate loads of all traffic carried averaged almost the maximum capacity available per airplane.

At the end of the period covered by the Board's report, the domestic air carriers, including Catalina with 61 miles and Hawaiian with 356, were authorized to operate over 48,724 route miles, serving 284 cities and towns in passenger service. Air mail pick-up operations served an additional 81 cities over 1,400 route miles.

The Board noted that it had authorized competing air service between San Francisco and Los Angeles; and that Washington, D. C., was provided with increased air services through authorization of two additional air carriers to serve the nation's capital. Direct service was also provided between such important cities as New Orleans-Shreveport-Dallas; Denver-Kansas City; San Antonio-Laredo; and Amarillo-Denver. In addition, new air service was provided to northeastern Wisconsin, one of the largest population groups in the United States heretofore lacking in air transportation service. National air service was also materially improved through inclusion of present air stops on additional existing routes.

Feeder Hearing

The Board disclosed that 348 applications, seeking to add nearly 4,000 new cities and towns to the national air transportation system were pending October 31, 1943. Since that time additional applications have increased the total to 487. A public hearing and investigation was also completed involving important questions concerning local, feeder, pick-up air service.

Many of the applications for local air service raised the question of the extent to which the Board may be authorized and warranted under the terms of the Civil Aeronautics Act in permitting surface carriers to engage in air transportation. Surface carriers have filed 99 applications for air service to date (March 1).

Internationally, the Board, upon approval of the President, added 1,075 miles to the certificated American Flag air transportation system by issuing a temporary 3-year certificate for service between New Orleans, La., and Guatemala City, Guatemala, via Merida, Mexico, thus providing a new air transportation gateway between the United States and Central and South America. The Board also, with the President's approval, awarded certificates to 21 Alaskan air carriers, marking the first step in the regulation of air transportation service in that territory.

International Service

Informal studies on international air operations are being conducted by the Board, which has invited interested persons to submit suggestions regarding international routes to be operated after the war. The Board also announced that it was proceeding with hearings, the first to be opened up since the beginning of the war, on applications for new airline service between the United States and points in Mexico, the Caribbean area, and Central and South America. The Board said 62 applications seeking new international and overseas air service were pending at the end of the period covered by the report. Since then 25 additional applications have been filed.

Private flying was materially curtailed because of wartime restrictions; instructional services and other commercial services by private operators continued as a high level. Among the tribulations of the private flier was the shortage of airplanes, difficulty in obtaining spare parts, and removal of civilian flying activities from the restricted coastal areas. These conditions resulted in a number of accidents somewhat higher than the 2 preceding years.

Air Almanac

The January–April and May–August, 1944 editions of the "American Air Almanac" may now be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. The former contains 242 pages and the May–August issue 245 pages. Copies are $1 each.

Atlantic Seaboard Route Given to National Airlines

The Board's recent decisions in regard to the Atlantic seaboard operations sought by five airlines resulted in a favorable outcome for National Airlines, a comparatively small company with operations in Florida and the Gulf states. Authorization has been granted National to extend its Miami-Tampa-Jacksonville route to New York.

The extension provides competitive service with that of Eastern Air Lines between New York and Florida, and establishes an air service along the coast connecting the port cities of New York, Norfolk, Wilmington, Charleston, Savannah, and Jacksonville.

In Florida, West Palm Beach was included as an intermediate point on National's route between Tampa and Miami, and Eastern was authorized to operate between its terminal point of Miami to Tampa.

In the same order the Board denied Seaboard Airways additional service between New York and New Orleans, and New York and Miami; Pennsylvania Central, local service between Rocky Mount, N. C., and Charleston, S. C.; and Eastern Air Lines, service between New York and Miami along the coastal route.

Colonial Airlines' application for a route between New York and Nassau via Charleston has been consolidated in the proceeding involving all applications for service between the United States, the Caribbean and Latin America, to be heard May 15.

Tipton Leaves Board For New ATA Job

Stuart G. Tipton, until recently assistant general counsel for the Civil Aeronautics Board, is now head of the legal staff of the Air Transport Association.

Tipton helped draft the Civil Aeronautics Act of 1938 and later headed the enforcement division of the Civil Aeronautics Authority. After 1940 he handled safety regulation work for the Board, and at the time of his resignation was Chief of Operations, Legal Division.

Load Hearing March 29

The public hearing which was to have been held February 8 before the CAB in Washington for the purpose of considering revision of load limits for commercial aircraft has been postponed to March 29.

Under consideration is the advisability of increasing the take-off weight of the DC–3 commercial transport plane by 1,000 pounds and its landing weight by 800 pounds. A 1,000 pound increase of both the landing and take-off weight of the Lockheed Lodestar will also be discussed. These proposals apply specifically to Douglas and Lockheed aircraft equipped with Wright G–202 or Pratt & Whitney S1C3G engines.

DOMESTIC AIR CARRIER STATISTICS

Operations for December 1943

Operator	Routes operated	Revenue miles flown	Revenue passengers carried [1]	Revenue passenger-miles flown	Express carried (pounds)	Express pound-miles flown	Passenger seat-miles flown	Revenue passenger load factor (percent)
All American Aviation, Inc	Pittsburgh-Jamestown, Huntington, Williamsport, Philadelphia, via Harrisburg.	83,508	0	0	10,293	1,291,351	0	
American Airlines, Inc	Dallas-Los Angeles	650,390	12,365	10,648,532	177,078	156,799,207	11,627,059	91.58
	New York-Chicago	407,343	16,179	6,107,646	741,657	292,381,987	6,969,173	87.64
	Boston-New York	115,648	11,142	1,958,611	316,559	56,037,153	2,269,046	86.32
	Boston-Cleveland	18,346	1,502	220,221	67,103	13,413,817	338,387	65.08
	Cleveland-Nashville	53,889	4,036	908,658	85,231	20,528,342	1,098,474	82.72
	New York-Fort Worth	582,405	15,435	8,742,739	365,075	191,542,577	9,859,199	88.68
	Washington-Chicago	162,861	5,148	2,238,128	174,885	84,666,067	2,661,532	84.09
	Chicago-Fort Worth	97,273	3,133	1,517,810	80,144	52,535,614	1,757,452	86.36
	Buffalo-Toronto	4,256	530	40,280	2,810	213,560	86,792	46.41
	El Paso or Fort Worth-Mexico City	115,707	1,588	1,636,521	17,015	16,909,688	2,019,613	81.03
	Total	2,208,118	71,058	34,019,146	2,027,557	885,028,012	38,686,727	87.93
Braniff Airways, Inc	Chicago-Dallas	202,798	5,650	3,271,610	81,189	47,420,621	3,507,573	93.27
	Denver-Brownsville	141,058	7,719	2,231,909	26,938	7,607,168	2,523,586	88.44
	San Antonio-Laredo	6,150	491	73,650	415	62,250	123,000	59.88
	Total	350,006	13,860	5,577,169	108,542	55,090,039	6,154,159	90.62
Chicago & Southern Air Lines, Inc.	Chicago-New Orleans	140,691	5,428	2,338,878	63,393	27,439,634	2,764,765	84.60
	Memphis-Houston	28,075	1,156	386,164	8,663	3,736,360	513,332	75.23
	Total	168,766	6,584	2,725,042	72,056	31,175,994	3,278,097	83.13
Continental Air Lines, Inc	Denver-El Paso	90,926	2,488	810,068	5,252	2,156,802	991,089	81.74
	Pueblo-Tulsa	34,964	1,220	270,812	1,613	401,286	367,251	73.74
	Total	125,890	3,708	1,080,880	6,865	2,558,088	1,358,340	79.57
Delta Air Corporation	Charleston and Savannah-Fort Worth	182,098	8,128	3,370,487	43,518	18,208,731	3,705,627	90.96
	Atlanta-Cincinnati	42,622	2,448	790,410	21,617	6,821,937	874,873	90.35
	Total	224,720	10,576	4,160,897	65,135	25,030,668	4,580,500	90.84
Eastern Air Lines, Inc	New York-Brownsville and San Antonio	397,898	12,301	6,831,950	149,160	74,951,008	7,991,940	85.49
	New York-Miami	514,729	13,760	7,724,896	191,249	145,401,797	8,656,770	89.24
	Chicago-Jacksonville	157,156	6,566	2,846,809	89,020	38,843,991	3,102,199	91.77
	Atlanta-Tampa	19,734	1,024	371,334	10,830	3,973,877	413,556	89.79
	Total	1,089,517	33,651	17,774,989	440,259	263,170,673	20,164,465	88.15
Inland Air Lines, Inc	Denver-Great Falls	46,602	1,101	350,528	2,329	470,227	515,466	68.00
	Cheyenne-Huron	28,306	0	0	66	15,146	0	
	Total	74,908	1,101	350,528	2,395	485,373	515,466	68.00
Mid-Continent Airlines, Inc	Minneapolis-Tulsa	132,702	3,582	1,031,894	17,047	3,764,575	1,696,777	60.81
	Minneapolis-Des Moines, St. Louis and Kansas City.	43,040	1,121	309,189	1,387	826,756	541,450	57.10
	Total	175,742	4,703	1,341,083	18,434	4,591,331	2,238,227	59.92
National Airlines, Inc	Jacksonville-Miami	72,734	3,485	859,183	13,643	3,284,309	1,004,431	85.54
	Jacksonville-New Orleans	118,069	3,744	1,384,704	23,662	9,109,592	1,580,486	87.61
	Total	190,803	7,229	2,243,887	37,305	12,393,901	2,584,917	86.81
Northeast Airlines, Inc	Boston-Presque Isle and Moncton	79,646	3,341	874,501	8,776	1,634,229	1,672,566	52.28
Northwest Airlines, Inc	Chicago-Seattle	460,984	12,382	6,924,455	161,504	95,675,209	8,140,474	85.06
	Minneapolis-Duluth	7,722	0	0	1,560	223,080	0	
	Total	468,706	12,382	6,924,455	163,064	95,898,289	8,140,474	85.06
Pennsylvania-Central Airlines Corp.	Norfolk-Detroit	228,405	18,738	3,899,327	384,311	71,815,022	4,751,204	82.07
	Detroit-Milwaukee	15,600	1,638	257,741	23,736	4,383,916	327,600	78.68
	Pittsburgh-Buffalo	13,080	846	173,883	14,468	3,049,218	274,680	63.30
	Pittsburgh-Birmingham	34,668	1,442	523,257	7,431	2,761,230	728,028	71.87
	Total	291,753	22,664	4,854,208	429,946	82,009,386	6,081,512	79.82
Transcontinental & Western Air, Inc.	New York-Los Angeles	910,720	19,750	12,351,298	579,986	321,917,714	14,228,826	86.80
	Dayton-Chicago	27,818	1,673	404,467	51,113	11,927,615	524,132	77.17
	Boulder City-San Francisco	62,149	1,369	726,153	23,487	11,030,558	856,123	84.82
	Kansas City-Pittsburgh via Chicago	268,438	5,861	3,163,135	251,717	123,370,383	3,562,655	88.79
	St. Louis-Detroit via Cincinnati and Dayton.	59,108	3,482	807,629	59,158	11,434,118	1,135,913	71.10
	Washington-Dayton via Columbus	42,778	1,812	623,904	29,286	9,014,194	802,633	77.73
	Total	1,371,011	33,947	18,076,586	994,747	488,694,582	21,110,282	85.63
United Air Lines, Inc	New York-San Francisco	1,517,717	22,279	21,695,596	842,066	683,410,628	23,023,657	94.23
	Salt Lake-Seattle	89,322	2,654	1,813,596	24,302	15,194,684	2,132,650	85.04
	Seattle-San Diego	397,201	18,389	7,285,822	131,775	49,043,539	7,704,919	94.56
	Seattle-Vancouver	6,462	885	118,856	1,441	483,416	130,689	90.95
	Toledo-Washington	44,916	1,183	822,346	17,552	7,129,940	898,590	91.52
	Total	2,055,618	45,390	31,736,216	1,017,136	755,262,207	33,890,505	93.64

See footnote at end of table

Operations for December 1943—Continued

Operator	Routes operated	Revenue miles flown	Revenue passengers carried	Revenue passenger-miles flown	Express carried (pounds)	Express pound-miles flown	Passenger seat-miles flown	Revenue passenger load factor (percent)
Western Air Lines, Inc.	San Diego-Salt Lake City	154,213	5,477	2,546,216	86,533	45,704,198	2,983,240	85.35
	Salt Lake City-Great Falls	30,258	906	385,446	2,995	1,144,105	597,685	64.49
	Great Falls-Lethbridge	8,319	396	59,654	418	67,371	173,528	34.38
	Total	192,790	6,779	2,991,316	89,946	45,915,674	3,754,453	79.67
	Grand total	**9,151,502**	**276,973**	**134,730,903**	**5,492,456**	**2,751,229,797**	**154,210,690**	**87.37**

[1] Where a company operates more than 1 route the passengers carried may be duplicated between routes.

Passengers carried (total revenue and nonrevenue) 283,537. Passenger-miles flown (total revenue and nonrevenue) 137,122,253.

Operations for 1943 compared with 1942

Operator	Revenue miles flown January–December		Revenue passengers carried January–December		Revenue passenger-miles flown January–December	
	1943	1942	1943	1942	1943	1942
All American Aviation, Inc.	1,029,751	847,591	0	0	0	0
American Airlines, Inc.	26,397,687	27,789,154	919,958	1,003,747	435,913,741	402,298,900
Braniff Airways, Inc.	4,057,199	4,293,644	171,581	151,310	66,520,573	50,320,916
Catalina Air Transport	0	41,924	0	8,684	0	260,520
Chicago & Southern Air Lines, Inc.	2,179,412	2,194,270	87,898	74,570	35,293,185	28,438,154
Continental Air Lines, Inc.	1,543,375	1,652,840	52,372	38,247	14,873,461	10,323,112
Delta Air Corporation	2,339,581	2,376,123	115,116	107,351	43,361,264	33,356,547
Eastern Air Lines, Inc.	13,210,748	16,247,496	408,470	482,352	215,352,713	218,063,530
Inland Air Lines, Inc.	850,449	995,766	12,440	11,410	4,011,549	3,291,984
Mid-Continent Airlines, Inc.	1,494,549	1,522,424	38,673	27,544	10,775,481	7,511,311
National Airlines, Inc.	1,923,697	1,536,027	76,173	55,158	23,036,901	15,412,680
Northeast Airlines, Inc.	726,941	788,478	36,263	26,446	9,091,388	5,383,171
Northwest Airlines, Inc.	4,475,129	4,701,432	121,567	111,177	63,787,683	52,061,159
Pennsylvania Central Airlines Corporation	3,097,469	4,104,626	244,961	263,730	52,312,234	54,977,785
Transcontinental & Western Air, Inc.	16,263,234	16,591,998	442,254	401,892	242,003,432	201,783,686
United Air Lines, Inc.	21,955,194	22,100,327	542,904	511,408	357,196,623	289,994,873
Western Air Lines, Inc.	2,057,068	2,318,740	80,907	74,108	32,589,240	24,563,818
Total	103,661,443	110,102,860	3,351,537	3,349,134	1,606,119,468	1,398,042,146
Index (1942=100)	94.10	100.00	100.07	100.00	114.88	100.00

Operator	Express carried (pounds) January–December		Express pound-miles flown January–December		Passenger seat-miles flown January–December		Revenue passenger load factor (percent) January–December	
	1943	1942	1943	1942	1943	1942	1943	1942
All American Aviation, Inc.	150,058	105,882	20,351,733	11,499,454	0	0		
American Airlines, Inc.	21,058,223	11,971,155	9,764,229,681	5,984,971,821	494,320,808	542,385,606	88.18	74.17
Braniff Airways, Inc.	1,393,250	1,012,240	703,613,330	388,626,710	72,503,860	74,723,374	91.75	67.34
Catalina Air Transport	0	64,088	0	2,011,530	0	379,320		68.68
Chicago & Southern Air Lines, Inc.	859,472	656,278	373,296,563	264,099,718	42,057,337	45,719,921	83.92	62.20
Continental Air Lines, Inc.	114,898	111,951	40,258,838	34,155,540	17,235,442	17,164,166	86.30	60.14
Delta Air Corporation	613,972	304,455	236,055,752	112,667,778	48,770,186	45,083,924	88.91	73.99
Eastern Air Lines, Inc.	4,519,080	4,033,106	2,760,485,818	2,473,888,653	246,616,267	311,483,029	87.32	70.01
Inland Air Lines, Inc.	25,832	39,817	5,891,744	7,358,698	6,083,895	9,064,872	65.94	36.32
Mid-Continent Airlines, Inc.	177,929	115,187	43,360,732	27,158,367	17,263,216	16,379,785	62.42	45.86
National Airlines, Inc.	343,578	218,599	101,817,131	61,679,928	26,701,876	24,942,834	86.27	73.59
Northeast Airlines, Inc.	114,810	87,292	23,226,246	22,685,699	15,258,008	14,980,294	59.58	35.94
Northwest Airlines, Inc.	1,554,732	1,143,249	1,000,534,952	856,605,160	76,038,052	79,577,636	83.89	65.42
Pennsylvania Central Airlines Corporation	4,357,938	2,407,277	790,484,269	467,834,158	64,420,997	83,380,170	81.20	65.94
Transcontinental & Western Air, Inc.	10,749,067	7,364,435	5,997,975,366	4,794,156,293	271,236,512	283,236,113	89.22	71.24
United Air Lines, Inc.	10,553,461	9,208,458	7,931,779,115	7,358,786,587	387,844,653	353,822,842	92.10	81.96
Western Air Lines, Inc.	957,291	1,258,188	442,487,901	567,022,831	38,498,693	39,348,869	84.65	62.43
Total	57,543,591	40,101,657	30,235,849,171	23,435,208,925	1,824,849,802	1,937,672,755	88.01	72.15
Index (1942=100)	143.49	100.00	129.02	100.00	94.18	100.00	121.98	100.00

	January	February	March	April	May	June	July
Passengers carried [1]	208,380	233,049	265,175	280,913	282,103	297,760	320,096
Passenger-miles flown [1]	101,410,602	110,982,551	124,256,467	132,984,531	133,266,615	140,745,710	150,013,387

	August	September	October	November	December	Total
Passengers carried [1]	338,059	321,616	322,099	301,253	283,537	3,454,040
Passenger-miles flown [1]	156,873,457	153,980,314	155,855,938	145,104,815	137,122,253	1,642,596,640

[1] Total revenue and non-revenue.

Airline Orders

Re Service

The applications of New York & Bermudian Air Line, Andrew J. Burke, and Southwestern Air Lines were consolidated by order 2660 with applications of other airlines, for service in Mexico, Central and South America, and the Caribbean. (Issued January 29.)

Oklahoma City and Amarillo, Tex., by means of order 2661 issued January 29, were permitted to intervene in the applications of various airlines.

After having consolidated into one proceeding applications of several airlines for service to midwestern cities, the Board, through order 2662, amended an earlier order so as to add to the proceeding pertinent applications of Chicago & Southern and TWA. By the same order, the Board denied Braniff's request that either it exclude from the proceeding an application, docket 1255, which sought unification of American's routes 7 and 21, or permit Braniff to include Boston on a proposed route. (Issued January 29.)

By its order 2663, issued February 1, the Board granted National Airlines permission to intervene re applications of certain airlines for certificates and amendments of certificates.

Braniff's petition for reconsideration of two previous orders and an opinion concerning the applications of certain airlines for service in the Texas area was denied by order 2668, issued February 2.

The Board ordered withholding from public disclosure certain agreements and documents filed by PANAGRA pursuant to section 251.2 of the Economic Regulations. (Order 2673, issued February 7.)

Board order 2674, dated February 7, directed withholding from public disclosure certain agreements and documents filed by PAA pursuant to section 251.2 of the Economic Regulations.

The motion of Kansas City Southern Transport Co. and the Kansas City Southern Railway Co. for indefinite postponement of a hearing on their applications and those of Mid-Continent, Delta and National, was denied by the Board on February 8 in order 2676.

The Board has approved American's request that the portion of its application in docket 932 which sought amendment of its certificate to include Joplin, Mo., on route 30 be consolidated with the application of TWA—docket 413. (Order 2678, issued February 9.)

National was granted permission—in Board order 2679—to serve Key West, Fla., through the use of Meacham Field beginning February 9, the date of this order.

Continental has been notified through Board order 2680, that the national defense no longer requires delaying inauguration of service on route 60. (Issued February 10.)

Through order 2681, issued February 10, the Board notified Continental that the national defense no longer requires delaying inauguration of service beyond the intermediate point Hobbs, N. Mex., to the terminal point San Antonio, Tex., via the intermediate points, Midland, Big Spring, and San Angelo, Tex., on route 29.

Board order 2682 states that the national defense no longer requires a delay in the inauguration of service by Braniff at Moline, Ill., on route 9. (Issued February 10.)

Beginning February 19, American may serve Joplin, Mo., through the use of Joplin Municipal Airport. (Order 2688, issued February 17.)

PAA was granted permission to inaugurate service on February 7 to Willemstad, Curacao, Netherlands West Indies, through the use of Hato Field. (Order 2689, dated February 17.)

Applications of various airlines for certificates authorizing additional service between points within the United States and proposed terminals Ottawa and Montreal, Canada, were consolidated by Board order 2690, issued February 17.

Certain exhibits received in connection with the proceeding concerning Continental's compensation for transportation of mail over routes 29, 43, and 60 will be withheld from public disclosure because they contain secret information affecting national defense. (Order 2691, issued February 17.)

Essair, Inc., and the cities of Fort Worth, Dallas, Lubbock, Amarillo, and Wichita Falls, Tex., were granted permission to intervene in the application of Braniff for amendment of its certificate through order 2693, dated February 17.

The petitions of TWA and Continental for leave to intervene in the application of Braniff for amendment of its certificate were denied in order 2694, dated February 17.

Order 2699 with supplemental opinion—issued February 19—amended certificate of EAL for route 40, and National for route 31, subject to certain conditions; denied applications of EAL—docket 592, PCA—docket 653, and National—docket 417, in all other respects; denied applications of EAL—docket 444, and Seaboard Airways—docket 435; consolidated applications of Colonial—dockets 445 and 594, with docket 525, et al., involving service between the United States and Latin America.

Board order 2700, issued February 21, granted Braniff permission to inaugurate service on February 16 to Moline, Ill., through the use of Moline Municipal Airport.

Beginning February 19, Mid-Continent may inaugurate service to Joplin, Mo., through Joplin Municipal Airport by authority of order 2701, issued February 21.

Through order 2702, dated February 22, the Board canceled, as of August 12, 1944, temporary certificate issued to PAA for service between Miami and Leopoldville, Belgian Congo, via certain intermediate points. The Secretary of War had notified the Board that the continuation of this service is no longer required in the interest of the national defense.

Continental's petition for intervention in Mid-Continent's application for a certificate was granted through Board order 2703, dated February 23.

The Board revised its previous amended order 2662 through order 2704, issued February 23, by withdrawing the application of Northeast, docket 1256, from a consolidated proceeding, docket 629 et al. The proposals in docket 1256 have been made a part of docket 954 and docket 1256 canceled.

Through order 2706, issued February 24, the city of Milwaukee was granted permission to intervene in the applications of certain airlines—docket 629 et al—for certificates.

Board order 2711, dated February 26, denied the petition of Jamestown, N. Y., to intervene in the applications of certain airlines for certificates—docket 629 et al.

Denied Elmira, N. Y., through order 2712, issued February 26, permission to intervene in the applications of certain airlines for certificates—docket 629 et al.

The petition of Northwest to intervene in the applications of various airlines for certificates was denied through order 2713, dated February 26.

Re Exemptions

Section 401 (a) of the Civil Aeronautics Act requires that an air carrier have a certificate before engaging in air transportation. Willemstad, Curacao, is not included in PAA's certificate, however, PANAM showed that its equipment would be more efficiently utilized by serving this stop. Therefore, on February 1, the Board issued order 2665 temporarily exempting them from 401 (a). Willemstad is an intermediate point between Ciudad Trujillo, Dominican Republic, and La Guaira, Venezuela.

Board order 2692, issued February 17, temporarily exempted Northern Cross from the requirements of section 401 (k) of the act insofar as they would prohibit Northern Cross from temporarily suspending service over its regular and irregular routes.

Miscellaneous

The Board approved a joint application which requested that C. Bedell Monro be permitted to hold the positions of president and director of PCA and director of Air Cargo, Inc. (Order 2666, issued February 1.)

Contract CAB 278—an agreement by and between Northwest, TWA, and Chicago & Southern—relating to the furnishing of joint guard services at Chicago Municipal Airport by Northwest was approved by the Board in order 2675, dated February 8.

An agreement, contract CAB 263, by and between various airlines concerning a resolution of the Air Traffic Conference of America relating to standard travel agents' publications, was approved by Board order 2677, dated February 8.

Through order 2698, issued February 19, the Board reissued certificates so as to reflect a change in corporate name—effective December 23, 1943—from United Air Lines Transport Corporation to United Air Lines, Inc.

Airman Orders

Re Suspensions

Floyd R. Ford and Roy Rudy's instructor ratings were suspended for 6 months beginning November 18, 1943, because they falsely certified solo time flown by trainees in a WTS program. The Board by order 2658, issued January 19, denied their subsequent request that they be permitted to act as instructors in WTS during this period.

The flight instructor rating of Harry Coppus was suspended for 6 months beginning November 18, 1943, because of a charge similar to that in the foregoing order. By its order 2659, the Board denied the request of Glen Woodmansee, assistant general counsel for the Administrator, that Coppus be permitted to instruct in an Army Link Instrument Program under WTS.

The student certificate of Darrell Curtis was suspended for 30 days by order 2670, dated February 4, because he carried passengers.

Board order 2671, issued February 4, partially suspended private certificate of Rickcliffe M. Decker for 1 year because he piloted an aircraft with dual controls giving flight instruction for hire and committed other violations of the Civil Air Regulations. Decker may, however, pilot civil aircraft while on official duty for, and at the direction of, the Civil Air Patrol or the AAF.

The mechanic certificate, with aircraft and aircraft engine ratings, of Hiram W. Scovel was suspended for 60 days by order 2672 issued February 2. Scovel certified he had made major repairs and alterations to an aircraft, restoring it to an airworthy condition, when he had not.

The student certificate of Ben Hurd was suspended for 90 days through order 2683, issued February 14. Hurd carried a passenger and failed to file a written report of an accident promptly.

For flying at a low altitude and also performing low acrobatics, the student certificate of William T. Weik, Jr., was suspended for 6 months by order 2685 issued February 16.

Through order 2687, dated February 16, Roy J. Carver's private certificate was suspended for 4 months and thereafter until he passes the required flight test. Carver didn't familiarize himself with available current flight information before take-off, didn't land at the nearest airport after encountering in-

strument weather, and flew within the limits of an airway during instrument weather without having filed any flight plan.

The private certificate of Stewart Hartshorn was suspended for 90 days by order 2695, issued February 18. While attempting to land, Hartshorn made two ground loops and then took off downwind creating an unnecessary traffic hazard when he could have continued landing without undue hazard to himself or others. Other violations of the Civil Air Regulations also were committed.

The private certificate of Robert R. Watson, Jr., was suspended for 90 days through order 2705, issued February 23. Watson was the owner of an aircraft which he operated after it was found to be unairworthy.

Harry S. Holcomb's mechanic certificate was suspended for 60 days through Board order 2707, issued February 25, for certifying an aircraft as airworthy when it was not.

Board order 2708, issued February 25, suspended the mechanic certificate of Ralph C. Bleke for 60 days because he endorsed a 100-hour periodic inspection report approving an aircraft as airworthy when it was not.

The Board suspended for 6 months the mechanic certificate, with aircraft and engine ratings, of Carlton C. Perkins through order 2709, issued February 25. Perkins signed repair and alteration forms certifying he had repaired aircraft in accordance with part 18 of the Civil Air Regulations when he had not.

Suspended mechanic certificate, with aircraft and engine ratings of Donald L. Curtis for 90 days through order 2710, issued February 25. Curtis supervised repairs on an aircraft which did not comply with current airworthiness requirements and signed a periodic inspection report without observing that the repairs had not been properly made.

Re Revocations

The Board amended a previous order which revoked the commercial certificate of Clifton S. Stovall for claiming $2,960 for the completion of training of 20 trainees in the CPT program when such training had not been given. Through order 2667, issued February 2, he may apply for a commercial certificate with instructor rating after February 1.

As the Administrator was not aware that Walter M. Zaiss held a private certificate until after the entry of order 2666, which revoked Zaiss' student certificate, the Board ordered Zaiss to show cause why the order should not be amended to revoke his private certificate also. (Order 2669, issued February 4.)

Order 2684, issued February 16, revoked the private certificate of Roye R. Stump for flying over a congested area at a low altitude and for carrying a passenger.

The flight instructor rating of Joseph Ule was revoked by Board order 2686, dated February 16. Ule gave flying instruction for hire before the issuance of said certificate.

Maynard T. Craig's mechanic certificate was revoked for 10 days because he signed an inspection report recommending an aircraft as airworthy when it was not. (Order 2696, issued February 18.)

Board order 2697, dated February 14, revoked production certificate No. 16 of Phillips Aviation Co. because they do not have adequate facilities at the Metropolitan Airport, Van Nuys, Calif., for the production of duplicates of engines, as required in their certificate.

Re Waivers

The Board, by order 2664, waived the provisions of section 21.10 of the Civil Air Regulations so that L. J. Royall, Jr., may apply for an airline transport certificate although he is under age. This order, issued February 1, prohibited him, however, from carrying passengers while he acted as first pilot.

Waived the provisions of section 27.15 of the Civil Air Regulations through order 2714, dated February 23, so that Forrest G. Roberts, Jr., may apply for an aircraft dispatcher certificate on or before September 1. He must have 90 days service under the supervision of a certificated aircraft dispatcher within the 12 months preceding the date of his application however.

Regulations

Reg. 301..... *Effective Feb. 1, 1944*

Notwithstanding section 40.2611 (b) of the Civil Air Regulations any first pilot listed in the Eastern Air Lines air carrier operating certificate on February 1, 1944, who is qualified as competent to operate an aircraft in scheduled air transportation between New Orleans, La., and Houston, Tex., on February 1, 1944, may pilot aircraft under day contact operations in scheduled transportation for said carrier into and out of Jefferson County Airport, Beaumont, Tex., upon furnishing evidence satisfactory to the Administrator showing that the pilot is thoroughly familiar with the form and condition of the airport and with the location and nature of any obstructions in the vicinity.

Reg. 302..... *Effective Feb. 15, 1944*

Notwithstanding the provisions of section 61.5[illegible]30 of the Civil Air Regulations any first pilot listed in the Mid-Continent Airlines, Inc., air carrier operating certificate on February 1, 1944, as competent to operate aircraft in scheduled air transportation between Kansas City, Mo., and Tulsa, Okla., may pilot aircraft under day contact conditions in scheduled transportation for said carrier between these points via Joplin, Mo., upon furnishing evidence to the Administrator showing that the pilot within the preceding 90 days has made a landing at the Joplin Airport and is familiar with the location and nature of any obstructions in the vicinity.

Amdt. 60–2..... *Effective Feb. 15, 1944*

60.97 Transportation of explosives and other dangerous articles. The following regulations shall govern the carriage of explosives and other dangerous articles in civil aircraft.

60.970 Definition of terms. As used in this section (60.97), the following terms shall have the following means: (*a*) "Interstate Commerce Commission Regulations" shall mean the Interstate Commerce Commission's "Regulations for Transportation of Explosives and Other Dangerous Articles by Land and Water in Rail Freight, Express, and Baggage Services, and by Motor Vehicle (Highway), and Water", effective January 7, 1941, as amended to April 28, 1943. (*b*) The terms "explosives" and "other dangerous articles" shall mean any article or substance classed as "Class A Explosives," "Class B Explosives," "Class C Explosives," "Inflammable Liquid," "Inflammable Solid," "Oxidizing Material," "Corrosive Liquid," "Noninflammable Compressed Gas," "Inflammable Compressed Gas," "Poison Gas or Liquid, Class A," "Poisonous Liquid or Solid, Class B," or "Tear Gas, Class C," in part 2 of the Interstate Commerce Commission Regulations.

60.971 Prohibited articles. No person shall operate a civil aircraft in flight carrying any article designated as a "forbidden explosive" in part 4, section 503, or as an explosive "not accepted" in part 5, section 653, or as an article "not accepted" in part 5, section 672 of the Interstate Commerce Commission Regulations or any other explosive and/or other dangerous article not designated in section 60.973.

60.972 Certificate of waiver. The Administrator may authorize the carriage of any of the articles prohibited by section 60.971 by issuing a waiver for such carriage: *Provided*, That no waiver shall be issued for the carriage of such articles by any aircraft carrying passengers for hire.

60.973 Acceptable explosives and other dangerous articles. Civil aircraft may be operated in flight carrying articles designated as "acceptable explosives" in part 5, section 654 or as "acceptable articles" in part 6, section 703 of the Interstate Commerce Commission Regulations.

60.974 Packing and shipping precautions. No person shall operate a civil aircraft in flight carrying explosives or other dangerous articles which are permitted by this section (60.97) unless: (*a*) such explosives and other dangerous articles have been appropriately packed and marked in accordance with the Interstate Commerce Commission Regulations; (*b*) such explosives and other dangerous articles have been placed in a baggage compartment inaccessible to passengers during flight; and (*c*) such explosives, other dangerous articles, and other cargo carried in the same compartment have been firmly lashed to the aircraft structure or otherwise secured in such manner as to prevent shifting in flight.

60.974 Safety equipment and small arms ammunition. Signaling devices and equipment necessary to promote safety in operation and small arms ammunition in moderate quantities for personal use may be carried without complying with the provisions of section 60.974.

60.975 Shipper's certificate. The operator of a scheduled air carrier aircraft may rely on a certificate signed by an authorized agent of the shipper that a given shipment meets the requirements set forth in section 60.973.

Amdt. 60–3..... *Effective Feb. 14, 1944*

Effective February 14, 1944, section 60.960 of the Civil Air Regulations—Transmission of Weather Information by Pilots During the Present War Emergency—is repealed.

New Aircraft, Equipment Approved

The CAA has approved new types of propellers, appliances, and aircraft and new models of previously accepted propellers and engine types as follows:

New Types

Aircraft: Andover Kent, Langley 2–4–90, 4-place closed land monoplane. Engines, 2 Franklins 4AC199E3. Type Certificate No. 755, issued December 29, 1943.

Parachute: Jahn, models BP–24B–100 and BP–28A–100, back pack, flat canopy type, 24 ft. and 28 ft. diameter respectively, white silk material. Type Certificate No. 153, issued January 24, 1944.

Propellers: Fahlin, D627A, D627A–1, –2, –3, and –4 and D629, D629–1, –2, –3, and –4; wood; 90, 89, 88, 87, and 86 in. diameter respectively; 78 in. to 63 in. pitch; 145 hp, 2,050 rpm. Type Certificate No. 800, issued February 11, 1944.

New Models

Propellers: G. B. Lewis, L–60, wood, 76 in. diameter, 57 in. to 45 in. pitch, 90 hp. 2,500 rpm. Type Certificate No. 796, issued January 8, 1944; and Sensenich, 82R8A, wood, 82 in. diameter, 72 in. to 66 in. pitch, 185 hp, 2,450 rpm. Type Certificate No. 538, issued January 14, 1944.

Engine: Jacobs, L–6MBA, 7 cyl. radial air-cooled. Ratings; Take-off, 330 hp, 2,200 rpm, 26 in. Hg manifold pressure; Maximum, except take-off, 300 hp, 2,100 rpm from sea level to 3,700 ft. altitude. Dry weight 573 lbs. Equipped with a rotor starting power take-off for use in autogyro aircraft. Type Certificate No. 195, issued December 22, 1943.

Correction

Several errors have been noted in the data captioned "Progress of Civil Aeronautics in the United States," which appeared in the January 15, 1944 Journal. Under "Domestic Air-Carrier Operations" the miles flown, daily average for 1941 should read 364,446. Under "Private Flying Operations" the third column of figures is for 1938 rather than 1933. Similarly, under "Certificates," the last column is for 1942 not 1943. It should also be noted that all fuel figures are in gallon units.

STATUS OF AIR REGULATIONS

Regulations as of March 1, 1944

HOW TO OBTAIN PARTS, AMENDMENTS, AND MANUALS

THOSE PARTS AND MANUALS ON WHICH A PRICE IS LISTED IN THE TABULATION WHICH FOLLOWS ARE ON SALE AT THE GOVERNMENT PRINTING OFFICE (SHOWN AS GPO IN TABLE), AND ARE NOT AVAILABLE FOR FREE DISTRIBUTION FROM THE CAA.

The Government Printing Office is the official sales agency for all government publications and is separate and distinct from the CAA and the Department of Commerce. The rules of the Superintendent of Documents require that *remittances be made in advance* of shipment of publications, either by coupons sold in sets of 20 for $1 and good until used, or by check or money order payable to the *Superintendent of Documents, Government Printing Office.* Currency is sent at sender's risk. Postage stamps, foreign money, and smooth coins are not acceptable. A discount of 25 percent is allowable to book dealers and quantity purchasers of 100 or more publications, on condition that the purchasers will adhere to the public sales price set by the Superintendent of Documents and that publications shall not be overprinted with any advertising matter.

Eventually, all Parts and Manuals will be placed on sale; meanwhile, those not yet on sale (carrying remark, "Order from CAA only") may be obtained without charge from the CAA upon demonstration of valid interest on the applicant's part.

The following tabulation carries in the right-hand column the numbers of all effective amendments to each Part and Manual issued subsequent to its publication. Parts and Manuals obtained from the CAA will include all effective amendments, but amendments for Parts and Manuals purchased from GPO must be requested separately from the CAA. When requesting amendments from the CAA, please be sure to state Part numbers for which they are desired.

ALL AMENDMENTS TO THE REGULATIONS, AND NOTICE OF NEW PARTS AND MANUALS ARE PRINTED IN THE CIVIL AERONAUTICS JOURNAL, AS RELEASED.

Bound volumes of the complete Civil Air Regulations are no longer available. Parts and amendments are punched for filing in standard three-ring binders.

For your guidance we have listed the Parts and Manuals applicable to the various airmen certificates issued.

Pilots:
Parts 01, 20, 60, 501, 503, and Manual 60.
Airline Transport Pilots:
Parts 01, 04, 21, 27, 40, 60, 61, 98, 501, 503, and Manuals 04 and 60.
Lighter-Than-Air Pilots:
Parts 01, 22, 60, 501, 503, and Manual 60.
Aircraft Mechanics:
Parts 01, 04, 15, 18, 24, 501, 503, section 60.32, and Manuals 04, 15, and 18.
Aircraft Engine Mechanics:
Parts 01, 04, 13, 14, 18, 24, 501, 503, and Manuals 04, 14, and 18.
Parachute Technicians:
Parts 15, 25, 54, 60, and Release 144.
Air-Traffic Control-Tower Operators:
Parts 26, 60, and Manual 60.
Aircraft Dispatchers:
Parts 27, 40, 60, 61, and Manual 60.
Ground Instructors (rating in Civil Air Regulations):
Parts 01, 20, 51, 60, 501, 503, and Manual 60.

PARTS CANCELED AND UNASSIGNED

Canceled Parts C0 and 03 now incorporated in Part 501; canceled Part 23 now incorporated in Part 51. Parts 90–96, inclusive, canceled. All other Part numbers not shown are unassigned.

Civil Air Regulations

Aircraft

Part No.	Title	Date	Remarks	Price	Effective Amendments
01	Airworthiness Certificates	10-15-42	On sale at GPO	$0.05	
02	Type and Production Certificates	3-1-41	On sale at GPO	.05	
04	Airplane Airworthiness	11-1-43	On sale at GPO	.15	
13	Aircraft Engine Airworthiness	8-1-41	On sale at GPO	.05	
14	Aircraft Propeller Airworthiness	7-15-42	On sale at GPO	.05	
15	Aircraft Equipment Airworthiness	11-15-40	In stock; order from CAA only		15-1, 15-2.
16	Aircraft Radio Equipment Airworthiness	2-13-41	On sale at GPO	.05	
18	Maintenance, Repair, and Alteration of Certificated Aircraft and of Aircraft Engines, Propellers, and Instruments.	9-1-42	On sale at GPO	.05	

Airmen

20	Pilot Certificates	9-1-42	On sale at GPO	$0.10	20-1 thru 20-6, Reg. Ser. 242, 247.
21	Airline Transport Pilot Rating	10-1-42	On sale at GPO	.05	21-1, thru 21-3, Reg. Ser. 278.
22	Lighter-Than-Air Pilot Certificates	10-15-42	On sale at GPO	.05	Reg. Ser. 247.
24	Mechanic Certificates	7-1-43	On sale at GPO	.05	
25	Parachute Technician Certificates	12-15-43	On sale at GPO	.05	
26	Air-Traffic Control-Tower Operator Certificates.	2-1-44	On sale at GPO	.05	
27	Aircaaft Dispatcher Certificates	10-1-43	On sale at GPO	.05	
29	Physical Standards for Airmen	6-1-42	On sale at GPO	.05	29-1.

Air Carriers

40	Air Carrier Operating Certification	11-1-42	On sale at GPO	$0.10	40-1, 40-2.

Air Agencies

50	Flying School Rating	11-1-40	On sale at GPO	$0.05	87, 113, 50-3, Reg. No. 216.[1]
51	Ground Instructor Rating	7-1-42	On sale at GPO	.05	
52	Repair Station Rating	10-1-42	On sale at GPO	.05	
53	Mechanic School Rating	8-1-42	On sale at GPO	.05	
54	Parachute Loft Certificates and Ratings	1-21-43	On sale at GPO	.05	

Air Navigation

60	Air-Traffic Rules	11-15-43	On sale at GPO	$0.10	60-1, N 60-2, N 60-3.
61	Scheduled Air-Carrier Rules	10-15-42	Out of stock	.10	61-1 thru 61-15.
66	Foreign Air-Carrier Regulations	1-15-42	On sale at GPO	.05	

Miscellaneous

97	Rules of Practice Governing Suspension and Revocation Proceedings.	12-10-43	In stock; order from CAA only		
98	Definitions	10-15-42	On sale at GPO	$0.05	
99	Mode of Citation of Regulations	11-15-40	In stock; order from CAA only		

[1] No copies available. (Waiver of requirements.) Consult CAA inspector for specific provisions of this amendment.

Regulations of the Administrator

Part No.	Title	Date	Remarks	Price	Effective Amendments
501	Aircraft Registration Certificates	3-31-43	In stock; order from CAA only		
503	Recordation of Aircraft Ownership	3-31-43	In stock; order from CAA only		
510	General Regulations, Washington National Airport.	9-25-41	In stock; order from CAA only		
511	General Aeronautical Rules for the Washington National Airport.	9-25-41	In stock; order from CAA only		
525	Notice of Construction or Alteration of Structures on or Near Civil Airways.	7-23-43	In stock; order from CAA only		
531	Seizure of Aircraft	12-8-41	In stock; order from CAA only		
532	Reproduction and Dissemination of Current Examination Materials.	1-15-43	In stock; order from CAA only		
600	Designation of Civil Airways	3-1-42	Not published [1]		1 thru 38.[1]
601	Designation of Airway Traffic Control Areas, etc.	1-15-42	Not published [1]		1 thru 62.[1]

Civil Aeronautics Manuals

04	Airplane Airworthiness	2-1-41	Out of stock		Release 50, 97,[2] 105,[2] 117,[2] 140.[1][2]
14	Aircraft Propeller Airworthiness	12-1-38	In stock; order from CAA only		
15	Aircraft Equipment Airworthiness	7-1-38	On sale at GPO	.10	
16	Aircraft Radio Equipment Airworthiness	2-13-41	In stock; order from CAA only		Release 62.
18	Maintenance, Repair, and Alteration of Certificated Aircraft and of Aircraft Engines, Propellers, and Instruments.	6-1-41	On sale at GPO	.50	
50	Flying School Rating	12-40	In stock; order from CAA only		Release 77, 111.
52	Repair Station Rating	2-41	In stock; order from CAA only		
53	Mechanic School Rating	5-40	In stock; order from CAA only		
60	Air Traffic Rules	8-1-43	On sale at GPO	.15	

[1] *See Air Navigation Radio Aids.* [2] *Only pertinent pages furnished.*

Shift-over to VHF

(*Continued from page 29*)

frequency ranges, and provides one pair of courses indicated visually in the aircraft by a zero-center, left-right indicator; and another pair of courses at right angles to the visual courses, which are indicated by A–N interlocked keying of 1,020 audio-cycle tone modulation.

"The antenna system of the VHF range is in general similar to that of the low-frequency range except that its physical size is very much smaller while the electrical spacing of the radiating elements in terms of the operating wave length is very much greater. The five radiating elements may be either horizontal loops or vertical rods, depending upon whether horizontal or vertical polarization is desired. One pair of diagonally opposite corner radiators and the center radiator constitute a complete two-course range antenna, so that the two pairs of diagonally opposite radiators form two two-course range antenna systems independent of each other except for the common center element. The pair of antennas radiating the signals that register on the visual indicator are excited 180 degrees out of phase by side band energy arising from modulation of the carrier frequency by 90 cycles and 150 cycles simultaneously, but from which the carrier frequency itself has been suppressed. The center element radiates the carrier frequency and also 90-cycle and 150-cycle side bands. The side band energy radiated from the center element combines vectorially with the radiation from the corner elements to produce a field pattern resembling two cardioids with axes extending in opposite directions along the line of radiators, and two points of intersection directly at right angles to the line of radiators. In one of these cardioid patterns the 90-cycle modulation predominates, in the other the 150-cycle modulation, while at the points of intersection both modulations are equal. Thus, the line of intersections defines a course with modulation at 90 cycles greater on the one side and with 150-cycle modulation greater on the other side.

"The other pair of radiators produce aural courses at right angles to the visual courses in exactly the same way, except that a single modulation tone frequency, 1,020 cycles, is used and the courses are defined by keying an N into one cardioid and an A into the other. The center antenna common to both systems must radiate the carrier frequency and all of the side bands required to produce the desired directional patterns in combination with the radiation from the corner antennas.

"The aircraft receiver for use with the VHF range is of conventional design. It has two independent output circuits; one for the 90- and 150-cycle frequencies which actuate the visual motor, and the other for the tone frequency and speech. The 90- and 150-cycle frequencies are separated by two band pass filters. The outputs of the filter sections are rectified, and the resulting d. c. voltages are applied in opposition to the zero-center meter so that it deflects to one side or the other depending upon whether the 90-cycle or 150-cycle signal is the stronger.

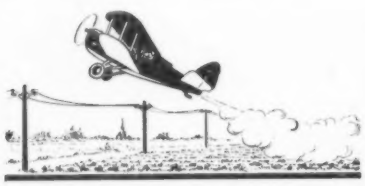
"The two-course-aural and two-course-visual range system has a number of important advantages over the four-course-aural range in addition to those already cited. In the case of the four-course range, the same 'off-course' signal is heard in two opposite quadrants. When a pilot is completely lost and must rely upon a four-course range for orientation, it may be a tedious and time-consuming process to determine which of two quadrants he is in. The two-course-aural and the two-course-visual range, on the other hand, has no quadrant ambiguity, since its courses are formed by four unidirectional patterns rather than by two bidirectional patterns. In this, too, the course indications are produced by varying modulation levels in the field about the station while the carrier itself is radiated in a circular pattern and does not vary with azimuth. It is thus possible to use automatic volume control in the aircraft receiver to eliminate or reduce fades and surges in the signal level over rough terrain without affecting the definition of the courses."

Accidents

(*Continued from page 40*)

dicated clearly that the wheels contacted the ground with the brakes locked and as the plane skidded forward the propeller had made its marks on the ground with each revolution. None of the many witnesses observed any fire and there was no indication of fire found in the airplane.

This model aircraft is equipped with a heating jacket around the carburetor intake with an exhaust tube which extends out of the side of the engine cowling and sparks and flame are visible during night flight. This exhaust flame is present, in varying degrees, in all airplanes but is not visible in daylight. Without Morgan's statement, it would be difficult to believe that a pilot-instructor with 60 hours of night flying experience could be so confused. The moon had risen within 5 minutes of the accident. It is possible that when the pilot looked back, he saw a streak of the exhaust and at the same time caught a glimpse of the rising moon over his tail surfaces and this combination of ordinary circumstances so confused him that he was convinced the tail of the airplane was on fire.



Wires and Crop Dusting Are a Poor Combination

Pilot Benjamin Franklin Austin was fatally injured in an accident which occurred near Litchfield, Ariz. Austin, age 40, held a commercial certificate with single-engine land, 0–330 hp, and flight instructor ratings. He had accumulated 1,141 hours of flight time, about 134 of which were in the type of aircraft involved. The aircraft, a Stearman C–3–R, received major damage.

Austin took off from the Goodyear Airport with 600 pounds of sulphur to dust a cottonfield 2 miles north of the airport. While on his third circuit of the field, witnesses observed the plane fly directly into a three-wire power line 35 feet high which bordered the north end of the field. The landing gear contacted the wires with sufficient force to pull up two supporting poles and drag the wires over a second power line 100 feet beyond. The plane turned over during its fall to the ground and came to rest in an inverted position.

Investigation revealed no evidence of failure of any part of the aircraft prior to collision with the wires. Weather conditions were favorable with unlimited ceiling and visibility and a west wind of 2 mph.

Austin was employed by the Quick Aviation Co., about 6 weeks prior to this accident. The subject flight was the first crop dusting flight he had made for the company as he had been working as a mechanic helping to get the equipment in condition. His experience could not be ascertained. However, he had represented himself to his employer as an experienced crop-dusting pilot. Before taking off Austin had made an aerial inspection of the field to be dusted.

"Follow the Leader" Flight Ends in Lake Geneva

LeRoy C. Lindahl was seriously injured in an accident which occurred on Lake Geneva, 10 miles northeast of Albert Lea, Minn. Lindahl, a WTS elementary trainee, had flown 21 dual and 17 solo hours, all in the type of airplane involved. The aircraft, a Piper J3C–50, was extensively damaged.

Lindahl took off from the Albert Lea Municipal Airport to practice maneuvers in an area northeast of the airport. Another student, James L. Sigman, was assigned to solo practice of similar maneuvers in a different section of the same practice area. About 40 minutes later several witnesses observed the two planes circling the town of Geneva, descending at times to an altitude described as below tree-top level in a "follow the leader" fashion. After 10 minutes of very low maneuvering in the vicinity, Lindahl's plane was seen to descend over the lake, headed in a northerly direction, and make a turn toward the west. The water was calm and glassy and the pilot was then facing the glare of the late afternoon sun. During the turn the plane continued to descend, and the left wing tip contacted the water. The plane cartwheeled violently to the left onto the right wing and sank in about 5 feet of water 150 yards off shore.

It is possible that Lindahl's attention was momentarily distracted by the other airplane and he neglected his flying, or he may have simply misjudged his distance above the water. Witnesses agreed that the engine seemed to be running normally at the time of impact. One witness stated that as soon as the airplane struck the water the other plane headed for the airport. Due to injuries sustained, Lindahl was unable to recall anything pertaining to the accident.

A Case of Mistaken Identity—Fire or Moonlight?

An accident which occurred at Hudson Airport, Garland, Tex., about 10:30 p. m., resulted in serious injuries to student Nick C. Boyarko and minor injuries to his instructor, Kenneth E. Morgan. Morgan, an instructor employed by the Dallas Aviation Co., held a commercial certificate with single-engine land, 0–270 hp, and flight instructor ratings. He had accumulated 1,300 hours of solo flight time, 60 of which were night flying. Boyarko held a student certificate and was enrolled for flight training at the Dallas Aviation School. The aircraft, a Fairchild 24 C8–F, was extensively damaged.

Instructor Morgan had intended to solo student Boyarko on the night of the accident, and had completed 2 dual practice flights around the airport, making 2 landings. About 10:30 p. m. they took off again toward the south on their third circuit of the field. When they had reached an altitude of 300 feet, the aircraft was observed to make the customary left turn in the traffic pattern and head in an easterly direction. Almost immediately thereafter, several witnesses saw the aircraft turn 180° to the left, after which the engine was throttled and the plane descended in a glide across the line of traffic to the west in what appeared to be an intended emergency crosswind landing. Traveling at a speed estimated to have been between 80 to 100 mph it contacted the ground wheels first, skidded forward about 100 feet, somersaulted to its back and slid another 100 feet forward before coming to rest on the airport.

Examination of the wreckage revealed no evidence of failure of any part of the aircraft prior to impact.

Driving to Crash Scene, Witness Runs Over Pilot

Pilot Virgil E. Steimer and his passenger, Edward W. Stritch, were seriously injured in an accident which occurred on the Euclid Avenue Airport, Willoughby, Ohio, on July 10, 1943. Steimer held a private pilot certificate with a single-engine land, 0–330 h. p. rating. He had flown about 207 solo hours, of which 3 were in the type of aircraft involved. Stritch, an apprentice mechanic, had formerly held a student pilot certificate which expired May 12, 1943. The aircraft, an Aeronca C–3, powered by an Aeronca 36 hp engine, was extensively damaged.

Pilot Steimer secured clearance for a flight to the Lake County Airport located on the opposite side of town. Accompanied by Stritch, he attempted to take off toward the east from a 1500-foot runway. (The wind was southeast about 6 mph.) After two unsuccessful attempts, he taxied to a 3,000-foot runway and took off toward the southwest over rising terrain with an electric powerline and trees in the flight path ahead. The aircraft became airborne approximately 1,000 feet down the runway and then climbed slowly to an altitude of from 40 to 50 feet. Near the airport boundary the pilot, apparently believing that he could not clear the wires and trees ahead, turned back. During this turn the plane was stalled and fell off to the left. It crashed on the nose and left wing about 50 feet inside the airport boundary. Both occupants unfastened their safety belts and crawled through the grass away from the wreckage. A witness to the accident drove across the airport to the scene and in so doing ran his car over the pilot inflicting further injuries.

The pilot used very poor judgment in attempting to take off in a heavily laden and low-powered aircraft over rising terrain with obstructions in the flight path, when he had already demonstrated to himself the poor performance of the aircraft under existing conditions.

Instructor Morgan stated that immediately after they had made their first left turn in the traffic pattern, the student asked him if he "didn't smell smoke" and added, "then I took a look out both left and right sides back towards the tail. It looked like smoke and flames and sparks were coming out the tail. I thought the tail end was on fire. Then I turned to the left 180°, heading west, throttling motor to an airspeed of 80 or 90 mph, closed throttle before reaching boundary of field. Touched ground at approximately 80 mph. I made a fast wheel landing. I could vision the tail burning and was in a hurry to get stopped. I must have pressed too hard on the brakes or was thrown forward on hitting the ground and pressed forward on the stick which put the airplane on its back." Marks on the ground in-

(*See Accidents, page 39 inside*)

U. S. GOVERNMENT PRINTING OFFICE: 1944